

Ross has been elected to the chair, and his title will be the Sir Alfred Jones professor of tropical medicine. Dr. J. W. W. Stephens has been elected to the Walter Myers lectureship in tropical medicine.

At the last meeting of the Lancaster Town Council, we learn from the *Lancaster Observer*, a letter was read from Prof. Percy Frankland, F.R.S., addressed to the principal of the Storey Institute, in which he announces his intention of giving to the Institute a sum of one hundred pounds to be devoted to the purposes of a "Frankland Prize" for chemistry, whereby the memory of his late father, Sir Edward Frankland, may be perpetuated in Lancaster, in which town he received his education and spent the early years of his life.

A NEW Technical College, the building of which has been completed at a cost of about 50,000*l.*, was opened at Wigan on Monday. Mr. R. B. Haldane, K.C., M.P., delivered an address, in which he said they had, through the enterprise of a few public-spirited people, established an institution which would take its place in that great organic structure of the national education which was slowly being built up. Referring to the question whether charters should be given to establish teaching universities in Manchester and Liverpool, Mr. Haldane said he was quite sure that, if not in a few weeks, at least in a few years, they would see those great centres of academic learning in full force, with full distinction of university power and stature.

In November last, Prof. Schmidt accompanied the German Emperor to England, and went to Oxford to investigate the details of the Rhodes scholarships. He has just reported the results of his conference with the Oxford authorities to the Kaiser. The Berlin correspondent of the *Daily Mail* reports that in an interview Prof. Schmidt remarked:—"The German Government unreservedly acknowledges the great value of the Rhodes scholarships, and will do its utmost to assist German students to avail themselves of them. You may state that the prospects of our accepting the scholarships are altogether favourable. There are no fundamental difficulties whatever in the way. Nothing but the difference between German and English university requirements suggests possible obstacles, the preparatory education of German students being so far in advance."

At the annual dinner of the Bristol University College Colston Society on Tuesday, Sir J. Crichton Browne, who was the principal guest, alluded to the subject of local universities. He said objections to universities were futile in consideration of the educational needs of the hour. What was wanted was not a lot of provincial universities, but a group of national English universities, which should collectively meet the higher educational wants of the country as a whole. Each university should have instructive features of its own, each adapted to its environment, but all supplying the best instructions, the highest culture and the finest discipline of the day. If Liverpool obtained the charter it sought, they would inevitably have modern universities in Manchester, Leeds, Durham, and Cardiff; and Bristol should not be content to be left out in the cold. It seemed inevitable that there would be a great extension of the university system in England; and there was no need to be afraid of going too far for some time to come, especially when one in 520 went now to Scotch universities, whereas only one in 5000 went to universities in England.

The development of higher education in the United States continues rapidly. The registrar of Columbia University, Mr. Rudolf Tombo, contributes to a recent number of *Science* certain interesting university registration statistics which reveal that the opening of each new academic year shows a marked advance over the last. The statistics are those of the beginning of November of last year, and deal with eighteen of the leading American universities. For the session preceding that with which the statistics deal, the relative rank of the seventeen leading universities on the basis of total enrolment was as follows:—Harvard, Columbia, Michigan, Chicago, California, Minnesota, Cornell, Wisconsin, Yale, Pennsylvania, Northwestern, Indiana, Nebraska, Missouri, Princeton, Leland Stanford and Johns Hopkins. If the students attending courses for teachers are counted, the total number for Harvard is 5468 and that for Columbia 5352. Chicago has had a considerable increase of students, and in Mr. Tombo's table ranks third, with 4296. Syracuse, which is included in the table for

the first time, has a larger enrolment than Indiana. The teaching staff at Harvard numbers 533, at Columbia 504; and at the Johns Hopkins University, where the total number of students is only 669, there are 147 teachers of different grades. Indiana seems to have the smallest staff, viz. 65 teachers for 1648 students.

THE Senate of the University of London has adopted a scheme for the inspection of schools and for a school-leaving examination in connection with which school-leaving certificates will be awarded. The purpose of the scheme is to secure that the new certificate shall admit the holder as a matriculated student of the University without further examination at the age of sixteen years, and that schools shall have freedom in the selection of the subjects of study pursued by their pupils. For pupils only able to attain the necessary standard in some, but not all, of the subjects required for the school-leaving certificate, their attainments will be set out on a school record. Opportunity will be afforded to the more capable pupils of obtaining credit for advanced work. As the course of study pursued by a pupil at school, his age, the period during which he has attended school, the subjects in which he has reached the standard required by the University, and also any form of manual, artistic or technical skill will be set out on the record, it should become a valuable testimonial to the pupil on entering life. In order to maintain the same standard for the matriculation examination and the school-leaving examination, the University proposes to appoint a small board of inspectors, consisting of persons of distinction and large teaching experience, who will act as moderators for the matriculation examination and be responsible for maintaining the standard of the school-leaving certificate.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, November 20, 1902.—"On the Correlation of the Mental and Physical Characters in Man." Part ii. By Alice Lee, D.Sc., Marie A. Lewenz, B.A., and Karl Pearson, F.R.S.

In a second paper on this subject read before the Royal Society, the following conclusions were reached:—

In order to meet an objection raised at the discussion on the first paper, the correlations were found, for the Cambridge graduates, between

- (1) Intelligence and the ratio $\frac{\text{length of head}}{\text{stature}}$,
- (2) Intelligence and the ratio $\frac{\text{breadth of head}}{\text{stature}}$;

both of these results came out even smaller than the correlations of intelligence and absolute head measurements.

The correlation between auricular height and intelligence in school-boys was found to be insensible. The statement made by MM. Vachide and Pelletier in the *Comptes rendus* that there is a correlation in this case appears to be based on meagre material and defective method.

The correlations between intelligence and (1) strength of pull, (2) strength of squeeze, (3) long sight are all negative, that is, the honours men have less strength and shorter sight than the pass men, but here again all these values are less than the probable errors, and consequently no weight can really be attached to them individually.

The correlation between intelligence and weight is slightly larger than the probable error.

The correlations of intelligence with

- (1) The ratio $\frac{\text{weight}}{\text{stature}}$,
- (2) The ratio $\frac{\text{weight}}{(\text{stature})^2}$,
- (3) The ratio $\frac{\text{weight}}{(\text{stature})^3}$

were found indirectly by formulæ, and (1) was also found directly; here again the results are of the same insignificant character as when absolute weights are taken.

Summing up the results of the calculations based on the Cambridge measurements, we come to the conclusion that the

honours men are slightly heavier, have slightly longer and broader heads, are not quite as tall or as strong as the poll men, and are slightly more short-sighted.

In no case, however, is the correlation sufficiently large to enable us to group the honours men as a differentiated physical class or to predict the intellectual capacity from the physical characters of the individual.

From the school measurements, the relation was investigated of athletics to health and to intelligence; there was found to be a sensible, but not marked, correlation between good health and intelligence; a marked correlation (0.4570) between good health and athletics, and a correlation of 0.2133 between intelligence and athletics.

Thus, while the intelligent are only slightly the more healthy, the athletic are notably the more healthy and are considerably more intelligent than the non-athletic.

It was found also that the athletic are the more popular and the more noisy, and tend to quick rather than to sullen temper. So far as the athletic character in the school-boy enables us to form a general estimate, the expressions "flannelled fool at the wicket" and "muddled oaf at the goal" seem hardly warranted.

Mathematical Society, January 8.—Dr. Hobson, vice-president, in the chair.—Dr. Larmor described the origin and progress of the movement for presenting to Mr. R. Tucker a permanent mark of appreciation of his services to the Society during his long tenure of the office of honorary secretary. The presentation was made by the chairman.—The following papers were communicated:—Prof. A. Lodge, Note on a method of representing imaginary points by real points in a plane. There is a (2, 2) correspondence of pairs of imaginary points, represented by conjugate imaginary coordinates, with pairs of real points. When the straight line joining the pair of imaginary points is real, the straight line joining the corresponding pair of real points cuts it at right angles. Examples of the application of the method to problems relating to conics were shown.—Dr. J. Larmor, On the mathematical expression of the principle of Huygens. The paper contains a direct intuitive proof of the integral formula put forward by Kirchhoff as the analytical expression of Huygens' principle. The proof is based on a method, analogous to that used by Green in the theory of potential, for determining, by means of its singularities, a function which satisfies the characteristic differential equation of wave propagation. Extensions of the same method to the conduction of heat in crystals and to electric waves are given. The redundancy of the data in Kirchhoff's formula is noted, and a comparison is made of the merits of this formula and of a well-known integral formula given by Poisson, considered as possible foundations for the principle of Huygens.—Prof. A. E. H. Love, Wave motions with discontinuities at wave-fronts. It is shown that when the wave motion is represented by means of a function which is not itself discontinuous at the front or rear of an advancing wave, the validity of the integral formulae given by Poisson and Kirchhoff for the representation of the function is not impaired by a discontinuity in the differential coefficients of the function at the front or rear of the wave. Certain classes of waves admit of being resolved into series of pulses, propagated independently of each other, the front and rear of a pulse being nodal wave-fronts presenting discontinuities of this type. This is the case for spherical sound waves and for electric waves of certain kinds. The paper contains a new explanation of the approximately rectilinear character of the propagation of light, according to which this character does not depend upon the periodicity of the waves, but upon the existence of a series of nodal wave-fronts.—Dr. H. F. Baker, Of functions of several variables. The paper is concerned with the problem of expressing a function of several variables, without essential singularities at points where the variables are finite, as a quotient of two integral functions. If p is the number of complex variables, the integral functions can be represented by integrals taken through $(2p-1)$ -fold domains which are bounded by $(2p-2)$ -fold loci. The domains of convergence of multiple power series are discussed, and the question of the existence of series of simpler functions capable of representing multi-periodic functions without finite essential singularities is considered.—Mr. W. H. Young, On non uniform convergence and the term by term integration of series. The case of term by term integration considered in the paper is the most general possible. Incidentally, the most general distribution of the points of non-uniform convergence of a series of point-wise discontinuous functions the sum of which is at most point-wise

discontinuous is found.—Prof. L. E. Dickson, Generational relations for the abstract group simply isomorphic with the linear fractional group in the Galois field $[2^n]$.—Rev. F. H. Jackson, Series connected with the enumeration of partitions (second paper).—Prof. W. S. Burnside, (1) On the Jacobian of two binary quantics considered geometrically, (2) On the resolution of some skew invariants of binary quantics into their factors in terms of their roots.—Mr. J. Brill, On the minors of a skew symmetrical determinant.

Geological Society, December 17, 1902.—Prof. C. Lapworth, F.R.S., president, in the chair.—Note on the magnetite-mines near Cogne (Graian Alps), by Prof. T. G. Bonney, F.R.S. These mines are situated in the Val de Cogne, one of the larger tributaries to the Val d'Aosta from the Graian Alps. At Filon Licone, the mass of magnetite is probably about 80 or 90 feet thick and some five times as long. At the Filon Larsine, the mass apparently is not nearly so thick. The ore is a pure magnetite, jointed like a serpentine, a thin steatitic film being often present on the faces. At both localities, the magnetite is found to pass rapidly into an ordinary serpentine, the transitional rock being a serpentinised variety of cumberlandite. The serpentine is intercalated between two masses of calc-mica-schists, with which green schists (actinolitic) are as usual associated, no doubt intrusively. The author discusses the relations of the magnetite and serpentine, which, in his opinion, indicate that a magnetitic must have been separated from a peridotite magma at some considerable depth below the surface, and the former, when nearly or quite solid, must have been brought up, fragment-like, by the latter; as in the case of metallic iron and basalt at Oviak (Greenland).—The elk (*Alces machlis*, Gray) in the Thames Valley, by Mr. Edwin T. Newton, F.R.S. During the construction of the Staines reservoirs, some mammalian remains were obtained from the alluvium of the Wrybury River, near the Thames at Youveney, and the author has recognised among them the skull and antlers, with other parts of the skeleton, of a true elk (*Alces machlis*). These are described. It appears that *Alces machlis* has been frequently found in peaty deposits in many parts of Great Britain and on the continent of Europe, but never in Britain in association with the mammoth; and it seems probable that in Europe and North America it was a rare animal in Pleistocene times, if indeed it was present before the close of that period.—Observations on the Tíree marble, with notes on others from Iona, by Mr. Ananda K. Coomaraswamy. The gneiss near Balephetrish has a general south-westerly and north-easterly trend, and the limestone occurs in it as lenticles. Descriptions of the varieties of the limestone in this locality are given. The inclusions comprise those of gneiss containing quartz, feldspars, hornblende, augite, scapolite and sphene as characteristic minerals, and mineral-aggregates consisting of sahite, coccolite, scapolite, sphene, apatite, calcite and mica. The contact-phenomena are not specially well displayed. The dynamic phenomena include the rounding of the minerals and the formation of "augen." The carbonates are present as a fine-grained granular matrix. Although there are exceptions, gneiss-inclusions and mineral aggregates have usually been protected from the effects of extreme pressure. The description of minerals includes carbonates, pyroxene, amphibole, forsterite, scapolite, sphene, mica, apatite and spinel. Various marbles are described from Iona, where they are associated with actinolite-feldspar schists and others; they are included in the gneiss.

MANCHESTER.

Literary and Philosophical Society, January 6.—Mr. Charles Bailey, president, in the chair.—Prof. F. E. Weiss gave an account of some of the botanical features of Western America. He began with a description of some of the work done at the experimental farms, and mentioned that Dr. Saunders, of the Experimental Station at Ottawa, had been able to obtain a hybrid between the Siberian crab-apple and a larger apple, which was able to grow and fruit freely in Manitoba. He then described the vegetation of the Rockies and the Selkirks, and pointed out the gradual change in vegetation in passing on to California.

DUBLIN.

Royal Dublin Society, December 16, 1902.—Prof. W. E. Thrift in the chair.—On the conservation of mass, by J. Joly, F.R.S.—An account of preliminary experiments made with a view to find if a mass change attended such physical transformations as formed the subject of Herr

Heydweiller's recent experiments. The reacting substances are suspended freely, but in separate vessels, at one extremity of a torsion balance the beam of which lies in the meridian, and at noon or midnight the reaction is started by contrivances described in the paper. A deflection of the beam is looked for, or a change in its angular velocity. A loss or gain of mass involves the energy associated with the inertia of matter moving with the earth's velocity, and on the assumption either that the momentum or kinetic energy is conserved, the possibility arises that a mechanical effect on the whole mass may become apparent. The results so far are negative, that is, no gross mechanical effect has been obtained. If such exists, it is not of a magnitude corresponding to the weight-change observed by Heydweiller. Several of Heydweiller's reactions were repeated. The method of observation is being improved.—Improved polarising vertical illuminator, by J. Joly, F.R.S. This is an improvement on a method previously described by the author of observing sections of transparent rock-forming minerals by light which has been twice transmitted through the section, the object being to increase the colour differences due to birefringence and so increase the discriminative value of the phenomena.—Prof. T. Johnson exhibited specimens of swede-rot, due to *Phoma*, received from County Down and not hitherto observed in Ireland. The fungus agrees in its characters with *Phoma Brassicae*, Thüm., causing a rot of fodder cabbages in France. It appears identical, including the pink colour associated with the conidia escaping from the pycnidia, with the *Phoma* described by Potteras causing a turnip-rot in the north of England.

Royal Irish Academy, January 12.—Prof. Atkinson, president, in the chair.—Prof. C. J. Joly read a paper on the quadratic screw system: a study of a family of quadratic complexes. He believes that the memoir contains a fairly full account of the arrangement of the screws in this important family. The method employed is that indicated in the author's note on systems of rays in the appendix to the new edition of Hamilton's "Elements of Quaternions."

EDINBURGH.

Royal Society, December 15, 1902.—Dr. Munro in the chair.—Prof. James Walker and Mr. A. J. Robertson communicated a paper on freezing-point depression in electrolytic solutions. The interest of the paper lay in the method adopted and in the great delicacy of manipulation required. In all experimental attempts to measure the freezing-point depression of solutions, the divergence of the actually observed temperature is known to depend upon the difference between the true freezing point and the "convergence temperature," and on the rate at which ice is formed or dissolved. The true freezing-point will be registered if either the convergence temperature and the true equilibrium temperature are identical, or the rate of formation or fusion of ice infinitely great. The experimental method adopted was that suggested by the latter condition. For a given quantity of solution, the more ice taken and the finer its division the more rapidly will the equilibrium temperature be restored after any disturbance, and the more closely will the apparent and true freezing points coincide. In the experiments described, the quantity of ice used was never less than 12 per cent. of the weight of the solution. The concentration of the solution was determined immediately after the determination of the freezing-point depression by filtering off a quantity of the liquid and analysing it. A complete experiment consisted in first determining these quantities for an approximately decinormal solution of acetic acid, and immediately thereafter the same magnitudes for a solution of a good electrolyte of approximately the same freezing point. The validity of the method was first tested by experiments with malonic acid which obeys Ostwald's dilution law; and then freezing-point experiments were made on certain strong electrolytes for which previous observers had obtained results which were not accordant with the ionisation values obtained from the conductivities. Taking into account all the difficulties and disturbing factors in experiments of this kind, the authors conclude that their results tend to increase confidence in the methods of exact cryoscopy.—Dr. G. A. Gibson gave a preliminary statement as regards the condition of the blood in cyanosis. He showed that the blood is always of high specific gravity, while the amount of hæmoglobin is increased. The number of the red blood corpuscles is almost invariably raised, sometimes to a very great degree, and

the white blood corpuscles are usually increased to a considerable extent. The object of the communication was to show that, although in cyanosis the different elements of the blood are increased throughout the whole vascular system, yet the increase is not uniform, as it is greatest in the veins, less in the capillaries and least in the arteries. Some years ago, the author brought forward the hypothesis that this increase in the blood elements is compensatory and is produced by the lessened destruction of the blood in consequence of diminished oxygenation. This explanation appears to be borne out by the fact that there is an increase in arteries, capillaries and veins, but the results of the present investigation show that any method based upon the assumption of a uniform condition of the blood throughout the system is fallacious. The concluding part of the paper was devoted to the effect of oxygen in cases of cyanosis; and the result of its employment thus far is to show that its effect upon the blood in cyanosis is inappreciable.—Dr. Gibson also gave a lantern demonstration on cases of acromegaly and gigantism.

PARIS.

Academy of Sciences, January 5.—M. Albert Gaudry in the chair.—Remarks on the composition of the gases from the fumeroles of Mont Pelée, and on the origin of volcanic phenomena, by M. Armand Gautier.—The results of the analyses of the gases from the volcanic fumeroles of Mont Pelée recently made by M. Moissan are compared with the analyses by the author of gases extracted from igneous rocks by heating to a red heat in a vacuum. The gases are qualitatively the same and of similar composition quantitatively, and a theory of volcanic action is deduced from these considerations.—A new examination of the objections of M. Leduc relating to the proportion of free hydrogen in air, by M. Armand Gautier. It is held that M. Leduc has not succeeded in answering the objections raised by the author in his last note, and in particular it is pointed out that air which has passed over to centimetres of red-hot copper oxide cannot be assumed to have been freed from all traces of combustible gases, since a portion of the hydrogen and methane in the air escape combustion even after passing over three times this length of glowing copper oxide.—On the use of the stereoscope in topography and in astronomy, by M. le Colonel Laussedat.—On some facts of endomorphism observed in the ruins of St. Pierre, Martinique, by M. A. Lacroix. A description of the phenomena which have taken place on the contact of iron materials with fused silicates, and showing the facility with which a volcanic rock, accidentally fused and kept in contact with divers materials, attacks them and transforms them both chemically and mineralogically.—On universal functions in space, by M. A. Korn.—On a new classification of the modes of nomographic representation of equations with any number of variables, by M. Maurice d'Ocagne.—A new method of testing rails, by M. Ch. Frémont. Three modes of testing rails are in actual use: by extension, flexure under a static charge, and flexure by shock. In the testing by flexure under a sudden load, which is of the highest practical importance, it is assumed that the rails are homogeneous, a condition which is by no means fulfilled in practice, and it is this want of homogeneity which is frequently the cause of the discordance between the results of the trial and those of practice. A method of testing is described in which this defect is avoided.—On a plane representation of space and its application to graphical statics, by M. B. Mayor.—On the dielectric cohesion of gases, by M. E. Bouty. When the pressure of the gas is of the order of some centimetres of mercury, the critical field necessary to overcome the dielectric cohesion of the gas is a linear function of the pressure; at very low pressures, it is not the field, but the difference of total potential corresponding to the thickness of the gaseous column which remains constant.—On the static work of muscle, by M. Charles Henry.—On the absolute value of the magnetic elements on January 1, 1903, by M. Th. Moureaux. A table is given showing the absolute values and secular variation of the magnetic elements at the Val-Joyeux Observatory.—On the activity of some salts of the rare earths as producing oxidation, by M. André Job. A solution of cerous acetate, although perfectly stable towards air, rapidly oxidises a solution of hydroquinone to quinhydrone. The acetate of lanthanum behaves similarly, from which the conclusion is drawn that a peroxide of lanthanum must be capable of existence.—On two new methods of synthesis of the oxyphosphinic

acids, by M. C. **Marie**.—On bromo-isopyromucic acid, by M. G. **Chavanne**. From the experiments described, it is probable that the constitution of isopyromucic acid remains still uncertain.—On a cellular structure in amorphous bodies, by M. G. **Cartaud**. The free surface of some suddenly cooled metals and some colloidion films presents the appearance of a microscopic cellular tissue. In some cases, each cell contains a circular nucleus in relief.—The oxidation of ammonia and amines by catalytic action, by M. A. **Trillat**. The action of a red-hot platinum wire on a mixture of amines and air has been studied; in presence of water, ammonia is transformed into a mixture of nitrate and nitrite, amines of the fatty series are decomposed and give the separate oxidation products of the alcohol and ammonia, and in the case of the aromatic amines the oxidation chiefly takes place in the chains containing alkyl groups.—The diminution in the amount of lecithin in heated milks, by MM. **Bordas** and Sig. de **Raczkowski**. Milk which has been sterilised by boiling over the naked flame, or by heating at 110° in an autoclave, loses about one-third of its lecithin, and it is possible that some of the digestive troubles traced to the use of sterilised milk may be due to this cause.—On the presence of labial kidneys and a phagocytal organ in the Diplopoda, by M. L. **Bruntz**.—On a new ergometer, by MM. Th. **Simon** and J. Ch. **Roux**. A description of a simple form of ergometer capable of measuring the work done by a muscle in the index finger.—Contribution to the study of locomotor reflexes, by M. Maurice **Philippon**.—On the revivification of the heart. The production of beating of the human heart thirty hours after death, by M. A. **Kuliako**. The heart removed from the body of an infant, aged three months, thirty hours after death, was submitted to an artificial circulation by the method of Langendorff with warm Locke's solution, saturated with oxygen. The heart commenced to beat after twenty minutes and the entire heart gave regular pulsations for an hour.—Researches on the physiology of the skin, by MM. N. **Vaschide** and Cl. **Vurpas**.—An earthquake at Smyrna, by M. **Yung**.

DIARY OF SOCIETIES.

FRIDAY, JANUARY 16.

ROYAL INSTITUTION, at 9.—Low Temperature Investigations: Prof. Dewar, F.R.S.

EPIDEMIOLOGICAL SOCIETY, at 8.30.—Discussion on the Bearing of Out breaks of Food-Poisoning upon the Etiology of Summer Diarrhoea. Opened by Dr. Newsholme.

TUESDAY, JANUARY 20.

ROYAL INSTITUTION, at 5.—Physiology of Digestion: Prof. A. Macfadyen.

ZOOLOGICAL SOCIETY, at 8.30.—Report on his Expedition to Uganda: J. S. BUDGETT.—On the Brain of *Nasalis* and some other Old-World Monkeys: F. E. Boddard, F.R.S.—On the Fishes collected by Mr. G. L. Bates in Southern Cameroon: G. A. Boulenger, F.R.S.—On the Anatomy of the Gephyrean *Phascosoma teres*, n.sp.: W. K. Hutton.

SOCIETY OF ARTS, at 8.—The Principles which should guide all Applied Art: G. F. Bodley.

ROYAL STATISTICAL SOCIETY, at 5.—The Finances of Federal Government for the United Kingdom: Hon. T. A. Brassey.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Discussion of paper on Electric Automobiles: H. F. Joel.

WEDNESDAY, JANUARY 21.

CHEMICAL SOCIETY, at 5.30.—Researches on Silicon Compounds. Part VIII., Interactions of Silicophenylamide with Thiocarbamide: J. Emerson Reynolds.—Phenocycloheptene: F. S. Kipping and A. E. Hunter.—(1) On the Relation between the Absorption Spectra and the Chemical Structure of Corydaline, Berberine and other Alkaloids; (2) The Absorption Spectra of Laudanine and Laudanoxine in Relation to their Chemical Constitution: J. J. Dobbie and A. Lander.—The Influence of Molybdenum and Tungsten Trioxides on the Specific Rotations of α -Lactic Acid and Potassium α -Lactate: G. G. Henderson and J. Prentice.—Estimation of Ethyl Alcohol in Essences and Medicinal Preparations: T. E. Thorpe and J. Holmes.—Carbon Monoxide as a Product of Combustion of the Bunsen Burner: T. E. Thorpe.—Derivatives of β -Resorcylic Acid and of Protocatechuic Acid: W. H. Perkin, Jun., and E. Schiess.—Synthesis of Imino-ethers. *N*-Ethyl-, Methyl-, and Benzylbenzimidino-Ethers: G. D. Lander.—(1) A Synthesis of 1,3,5 Triphenyl-2,4-Dimethylcyclopentane and of 1,3,5 Triphenyl-2-Methylcyclopentane; (2) The Condensation of Phenyl-Ethylketone (propionone) with Benzalacetone-Phenone, and of Acetophenone with Benzalpropionone: R. D. Abell.—Formation of Carbazoles by the Interaction of Phenols, in the Orthoketonic Form, with Arylhydrazines: F. R. Japp and W. Maitland.—(1) Dimorphism of α -Methylphenylhydrazonobenzil; (2) The Oxidation Products of the Methyl Homologues of Anhydrazonobenzil: F. R. Japp and A. C. Michie.

ROYAL METEOROLOGICAL SOCIETY, at 7.30.—Annual General Meeting.—The president (Mr. W. H. Dines) will deliver an Address on "The Method of Kite-Flying from a Steam Vessel and Meteorological Observations obtained thereby off the West Coast of Scotland."

ROYAL MICROSCOPICAL SOCIETY, at 8.—President's Annual Address.

SOCIETY OF ARTS, at 8.—The Metric System: A. Sonnenschein.

GEOLOGICAL SOCIETY, at 8.—The Figure of the Earth: Prof. W. J. Sollas, F.R.S.—The Sedimentary Deposits of Southern Rhodesia: A. J. C. Molyneux.

ENTOMOLOGICAL SOCIETY, at 8.—Annual Meeting.—Address by the President.

THURSDAY, JANUARY 22.

ROYAL SOCIETY, at 4.30.—*Probable papers*:—Preliminary Note on the Relationships between Sun-spots and Terrestrial Magnetism: Dr. C. Chree, F.R.S.—Characteristics of Electric Earth-Current Disturbances and their Origin: J. E. Taylor.—Solar Eclipse of 1900, May 28. General Discussion of Spectroscopic Results: J. Evershed.—On the Electrodynamical and Thermal Relations of Energy of Magnetisation: Dr. J. Larmor, Sec. R.S.

SOCIETY OF ARTS, at 4.30.—Indian Domestic Life: J. D. Rees.

ROYAL INSTITUTION, at 5.—Pre-Phœnician Writing in Crete and its Bearings on the History of the Alphabet: Dr. A. J. Evans, F.R.S.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Discussion on the Metric System. Opened by Mr. Alexander Siemens, in favour of the Metric System, and by Sir Frederick Bramwell, Bart., in favour of the British System.

FRIDAY, JANUARY 23.

ROYAL INSTITUTION, at 9.—Recent Volcanic Eruptions: Dr. Tempest Anderson.

SATURDAY, JANUARY 24.

MATHEMATICAL ASSOCIATION, at 2.—On some Class Diagrams for Intuitive Geometry: E. M. Langley.—On the Representation of Imaginary Points on a Plane by Real Points: Prof. A. Lodge.—Incommensurables by Means of Continuous Decimals: Edwin Budden.

CONTENTS.

PAGE

The Holy Shroud of Turin. By Prof. R. Meldola, F.R.S.	241
Irish Folklore	243
Migratory Locusts. By W. F. K.	245
Our Book Shelf:—	
Duncan: "Applied Mechanics for Beginners"	245
"Compte rendu du deuxième Congrès international des Mathématiciens tenu à Paris, 6 au 12 Aout, 1900"	245
Boulger: "Wood: a Manual of the Natural History and Industrial Applications of the Timbers of Commerce"	245
Malméjac: "L'Eau dans l'Alimentation"	246
Barnett: "Our Dogs' Birthday Book"	246
Letters to the Editor:—	
The Hydrographical Work of the North Sea Investigation Committee (Scotland):—Prof. D'Arcy W. Thompson	246
The Quadrantids of 1903.—G. McKenzie Knight	247
Sun-spots and Summer Heat. (With Diagram.)—Alex. B. MacDowall	247
A Curious Projectile Force.—B. A. Oxon	247
The Hewitt Mercury Lamp and Static Converter. By C. V. B.	248
The Vibrations of Gun Barrels. (Illustrated.) By Prof. G. H. Bryan, F.R.S.	248
Prof. John Young. By Prof. John G. McKendrick, F.R.S.	249
James Wimshurst, F.R.S.	250
Notes	250
Our Astronomical Column:—	
New Variable Star 21, 1902, Sagittæ	254
"The Heavens at a Glance," 1903	254
Observations of Long-period Variable Stars	254
Observations of Occultations	254
The Vaccination Acts. By Dr. John C. McVail	254
An American Report upon the West Indian Eruptions. (Illustrated.)	256
Prizes Proposed by the Academy of Sciences for the Year 1903	259
London Conference of Science Teachers. By A. T. S.	259
University and Educational Intelligence	260
Societies and Academies	261
Diary of Societies	264